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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/593,956	09/22/2006	Hans-Christoph Magel	R.307235	4044
2119	7590	08/06/2007		
RONALD E. GREIGG GREIGG & GREIGG P.L.L.C. 1423 POWHATAN STREET, UNIT ONE ALEXANDRIA, VA 22314			EXAMINER GIMIE, MAHMOUD	
			ART UNIT 3747	PAPER NUMBER
			MAIL DATE 08/06/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/593,956

Applicant(s)

MAGEL, HANS-CHRISTOPH

Examiner

Mahmoud Gimie

Art Unit

3747

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 September 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 12-31 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 12-31 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 September 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 9/22/06; 2/23/07.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 12-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boecking (US 2003/0062026).

Boecking discloses a common rail injector (2) for injecting fuel into a combustion chamber of an internal combustion engine, having an injector housing including a fuel supply line communicating with a central high-pressure fuel source outside the injector housing and with a pressure chamber inside the injector housing, from which pressure chamber, as a function of the position of a 3/2-way control valve (6), fuel subjected to high pressure is injected, the improvement wherein the control valve (6) comprises a valve piston (14) which is movable back and forth in the injector housing (1) between a position of repose and an injection position, which valve piston (14) is coupled hydraulically (19) with a piezoelectric actuator (7) that is subjected to the pressure from a hydraulic fluid.

Boecking does not teach that the piezoelectric actuator is subjected to a high-pressure fuel source.

However, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to substitute a high-pressure fuel for the hydraulic fluid to

obtain a predictable result of controlling the piezoelectric actuator by the high-pressure fuel (KSR).

Regarding claim 13, wherein the injector housing a hydraulic coupling chamber (18, 19) subjected to the pressure from the high-pressure fuel reservoir (substitute fuel as above), and wherein the piezoelectric actuator is coupled hydraulically with the valve piston (14) by way of said coupling chamber (18, 19).

Regarding claim 14, further comprising a pressure face embodied on the valve piston (14) and subjected constantly to high pressure from the fuel supply line (substitute fuel for hydraulic fluid).

Regarding claim 15, further comprising a pressure face embodied on the valve piston (14) and subjected constantly to high pressure from the fuel supply line.

Regarding claims 16-19, wherein a first end (top end) of the valve piston (14) defines the hydraulic coupling chamber (18,19), and a second end (lower end) of the valve piston protrudes into a valve control chamber (24), which control chamber in the injection position of the valve piston is in communication with a fuel return (25) and which in the position of repose of the valve piston is subjected to the pressure from the high-pressure fuel reservoir.

Regarding claims 20 and 21, further comprising a first sealing edge on the valve piston (14) which interrupts a communication between the valve control chamber (24) and the fuel return (25) when the valve piston is in the position of repose and a second sealing edge on the valve piston which interrupts a communication between the high-pressure fuel reservoir and the valve control chamber in the injection position of the valve piston.

Regarding claims 22 and 23, further comprising a first sealing edge on the valve piston (14) which interrupts a communication between the valve control chamber (24) and the fuel return (25) when the valve piston is in the position of repose and a second sealing edge on the valve piston which interrupts a communication between the high-pressure fuel reservoir (5) and the valve control chamber (24) in the injection position of the valve piston.

Regarding claims 24-26, further comprising a valve piston guide (bore) portion embodied on the first end of the valve piston, the valve piston guide having a diameter somewhat less than the diameter of the first sealing edge.

Regarding claim 27, wherein the valve piston (14) is embodied in one piece.

Regarding claims 28 and 29, wherein the valve piston is embodied in two parts (optional design choice).

Regarding claim 30, wherein the valve control chamber (24) communicates with a valve member control chamber (3).

Regarding claim 31, wherein the valve control chamber (24) is in communication with a pressure booster (13) control chamber.

Conclusion

3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The cited references show common-rail fuel injectors.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mahmoud Gimie whose telephone number is 571-272-

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4841. The examiner can normally be reached on Monday-Friday between 7 a.m. -3:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen K. Cronin can be reached on 571-272-4536. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



MG

**MAHMOUD GIMIE
PRIMARY EXAMINER**